

IN THE CLAIMS:

The following is a complete listing of claims in this application.

1. (currently amended) ~~A The method for packet processing for data transmission over an optical fiber, the method comprising the steps of according to claim 17, wherein said step of processing comprises:~~

~~segmenting an incoming bit stream of data of at least one service;~~

~~adding a tag to a header of each segment, each tag including data identifying a route between a source and a destination end-point of the bit stream;~~

~~encapsulating said tagged segment into a Point-to-Point Protocol (PPP) packet in a frame; and~~

~~mapping the encapsulated packet into a transmission frame for transmission over an optical fiber.~~

2. (original) The method according to claim 1, wherein said tagged segment is encapsulated into a PPP packet in a High bit rate Digital Link Control (HDLC)-like frame.

3. (original) The method according to claim 1, wherein said transmission frame is a Packet over SONET (PoS) frame.

4. (original) The method according to claim 1, wherein said transmission frame is a Packet over SDH (PoS) frame.

5. (original) The method according to claim 2, wherein said transmission frame is a Packet over SONET (PoS) frame.

6. (original) The method according to claim 2, wherein said transmission frame is a Packet over SDH (PoS) frame.

7. (original) The method according to claim 3, further comprising the step of scrambling the encapsulated packet before the step of mapping into a transmission frame.

8. (original) The method according to claim 1, wherein said step of adding a tag includes adding an MPLS tag.

9. (original) The method according to claim 1, further comprising the steps of:

de-packing said transmission frame in a receiver to retrieve said encapsulated PPP packet;

de-capsulating said encapsulated PPP packet to retrieve said tagged segment of a bit stream; stripping off the tag to retrieve said segment of a bit stream; and

assembling a plurality of said segments to re-create the original bit stream.

10. (original) The method according to claim 9, further comprising the step of unscrambling a scrambled encapsulated PPP packet, after the step of de-packing.

11. (previously presented) The method according to claim 5, further comprising the steps of:

de-packing said Packet over SONET packet in a receiver to retrieve said encapsulated PPP packet in HDLC-like form;

de-capsulating said encapsulated PPP packet to retrieve said tagged segment of a bit stream;

stripping off the tag to retrieve said segment of a said bit stream; and

assembling a plurality of said segments to re-create the original bit stream.

12. (currently amended) ~~An~~ The engine for packet processing and data transmission, the engine comprising according to claim 19, wherein said processing modules comprise:

~~a segmentation module for segmenting an incoming bit stream of data of at least one service;~~

~~a tagging module for adding a tag to each segment, each tag including data identifying a route between a source and a destination end point of said bit stream;~~

~~an encapsulating module for encapsulating the tagged~~

segment into a Point-to-Point Protocol (PPP) packet in a frame; and

a mapping module for mapping the encapsulated packet into a transmission frame for transmission over an optical fiber.

13. (original) The engine according to claim 12, wherein said PPP packet is encapsulated in a High bit rate Digital Link Control (HDLC)-like frame.

14. (original) The engine according to claim 12 wherein said transmission frame is a Packet over SONET/SDH (PoS) frame.

15. (original) The engine according to claim 13 wherein said transmission frame is a Packet over SONET/SDH (PoS) frame.

16. (currently amended) The engine according to claim 12, wherein said tagging module is arranged to add an MPLS tag to each segment.

17. (new) A method for packet processing for data transmission over an optical fiber, the method comprising the steps of:

receiving an incoming bit stream of data of at least one service;

segmenting said bit stream in its original protocol into variable length segments according to available transmission bandwidth;

adding a tag to each segment, each tag including data identifying a route between a source and a destination endpoint of the bit stream; and

processing each said segment for transmission in a transmission frame,

whereby utilization of available bandwidth capacity is optimized.

18. (new) The method according to claim 17, wherein the

incoming bit stream of data comprises at least two services.

19. (new) An engine for packet processing and data transmission with optimization of available bandwidth capacity, the engine comprising:

at least one service port for receiving an incoming bit stream of data of at least one service;

a segmentation module for segmenting said bit stream in its original protocol into variable length segments according to available transmission bandwidth;

a tagging module for adding a tag to each segment, each tag including data identifying a route between a source and a destination end-point of the bit stream; and

at least one processing module for processing each said segment for transmission in a transmission frame.